American Fern Journal 102(2):184–186 (2012)

Shorter Notes

***Cheilanthes feei* T. Moore (Pteridaceae) and *Dryopteris erythrosora* (D.C. Eaton) Kunze (Dryopteridaceae) New for the Flora of North Carolina.**—Recent field and herbarium work has added these two species to the spontaneous flora of the state of North Carolina, USA. *Cheilanthes feei* is native to the center of the continent; its core range extends from eastern Minnesota and Texas, south to northern Coahuila and Chihuahua, and west to southern Nevada and extreme southeastern British Columbia (Windham and Rabe, *Cheilanthes*. In: Flora of North America. Oxford University Press, New York. 1993; Mickel and Smith, The Pteridophytes of Mexico. The New York Botanical Garden Press, New York. 2004). From this core area, there are two reported disjunctions. The first, in central northern Kentucky (Reed. Amer. Fern J. 42:53–56. 1952.) is approximately 200 km east of the main range, and the second, along the New River in western Virginia (Wieboldt and Bentley, Amer. Fern J. 72:76–78. 1982.) is another 450 km to the east. In both cases, the species was found on limestone or dolomitic cliffs, its typical habitat.

Recent curatorial activities at the Duke University herbarium (DUKE) resulted in the discovery of this species as new for North Carolina. A single specimen was collected in 1930 by Hugo Blomquist in Durham County (some 200 km SE of the nearest station, in Virginia), but was misidentified as the more common *Cheilanthes tomentosa* Link. The Blomquist specimen is undoubtedly *C. feei* and not *C. tomentosa*, based on the absence of scales on the rachises and costae, and the glabrescent adaxial surfaces of the ultimate segments. Unfortunately, the label data describe the collection location merely as "Eno River, Durham, NC." Given that Blomquist was based in Durham, and that his databased collections from June 1930 are all from North Carolina (including one from Durham County: www.herbarium.unc.edu/seflora; www.tropicos.org), it seems unlikely that this record is due to a labeling error. Subsequent searches by the authors and associates along the Eno River failed to discover any extant populations, but such may well still exist.

This record continues a noteworthy pattern of disjunction for western cheilanthoid ferns: in most cases where a predominantly western species has populations east of the Appalachians, the species involved is an apomictic triploid. Species fitting this pattern include *Cheilanthes feei, C. eatonii* Baker (*C. castanea* Maxon), *C. alabamensis* (Buckley) Kunze, and *C. tomentosa*. This pattern is also seen in the related genus *Astrolepis*, where two apomictic triploids (*A. sinuata* (Lagasca ex Swartz) D.M. Benham & Windham ssp. *sinuata* and *A. integerrima* (Hooker) D.M. Benham & Windham) have eastern disjunct populations far from their core western ranges (disjunct to Georgia and Alabama, respectively; Weakley, Flora of the Southern and Mid-Atlantic States. The University of North Carolina Herbarium, Chapel Hill, NC. 2011). This tendency for apomictic taxa to have long-distance geographic disjunctions is consistent with their breeding system. As asexuals, they need only a

FIG. 1. *Dryopteris erythrosora* along the Ellerbe Creek, Durham, North Carolina. **A)** Habit and habitat. **B)** Close-up of a leaf. Photos: Sarah Zylinski.

single spore to land in a suitable habitat in order to potentially establish a new population. In contrast, many sexual cheilanthoid ferns appear unable to undergo intragametophytic selfing, and thus require two spores to establish and produce gametophytes in close enough proximity to permit cross-fertilization before a population can be established.

Cheilanthes feei T. Moore. Eno River, Durham, North Carolina. Exposed rocks. H.L. Blomquist 1649 (DUKE 10973). June, 1930. Det'd M.D. Windham, 2006.

Like *C. feei*, *Dryopteris erythrosora* is an apomictic triploid. It is native to woodlands of eastern Asia but is common in the North American horticultural trade, where it is sold under the name Autumn Fern (Hoshizaki and Wilson, Amer. Fern J. 89:1–98. 1999; Hoshizaki and Moran, Fern Grower's Manual. Timber Press, Portland, OR. 2001). In North America, it has been reported from Georgia (Weakley, 2011) and Arkansas (Simpson *et al.*, Amer. Fern J. 98:111–112. 2008). We found it growing in a typical habitat—a disturbed suburban woodlot—in Durham County, North Carolina. It was uncommon, in the company of other native and nonnative taxa, without any indication of it (or anything else) having been planted on the site or in the vicinity (Fig. 1).

While *Dryopteris erythrosora* does not appear to be spreading aggressively in Durham, this report extends a potentially worrisome trend of non-native temperate ferns naturalized from presumably horticultural sources (e.g., *Macrothelypteris*—Gorman *et al.*, Journal of the Botanical Research Institute of Texas 5:343–344. 2011; *Athyrium nipponicum* and *Deparia petersenii*—Weakley, 2011; *Hypolepis tenuifolia* (G. Forster) Bernh.—Peck, Phytoneuron 30:1–33. 2011; *Arachniodes*—Gordon, Amer. Fern J. 71:65–68. 1981).

Dryopteris erythrosora (D.C. Eaton) Kunze. Durham County, North Carolina. Durham, Old West Durham neighborhood. Tributary of Ellerbe Creek, just

north of Sunset Ave, between Carolina Ave and Albany St. N36.02361 W78.92577 +/−8m. Elevation: 153 m. Two plants seen (but there were more earlier in the year; they presumably got washed away). Just above scour zone of small suburban creek, on disturbed, steep sandy banks, with *Impatiens, Toxicodendron, Polystichum, Viola, Boehmeria, Vinca*, other invasive shrubs, etc. Under *Morus, Acer negundo, Fraxinus*, etc., in weedy ridge through floodplain forest. 2010-August-08. C.J. Rothfels 3959, with S. Zylinski (DUKE 401869). Det'd C.J. Rothfels & E. Sigel, August 2010. ! C. Fraser-Jenkins (from photos), August 2010.

We thank Christopher Fraser-Jenkins for confirming the identification of the *Dryopteris*, Dylan Burge, Amanda Grusz, Beth Guy, Layne Huiet, Fay-Wei Li, and Lisa Pokory for their efforts in our as-yet unsuccessful attempts to locate extant North Carolina populations of *Cheilanthes feei*, and Jennifer Geiger (Editor) and two anonymous reviewers for improvements to the manuscript.—
C. J. Rothfels, E. M. Sigel, and M. D. Windham, Department of Biology, Duke University, Durham, North Carolina.